

Electrical code issues and answers.

● Conductor Termination Compound.

Listed conductor termination compounds used on splices and terminations to retard oxidation must be suitable for use with the conductor type it is applied to. These compounds do not have a harmful effect on the listed conductors metals, insulation or equipment when used as per manufacturer's installation instructions. Care must be used when applying these compounds to ensure that an excessive amount is not applied. Excessive compound may melt and flow down into breakers or the equipment and affect their operation.

● When is a Light Required in an Attic, Under Floor Space, Etc?

NEC 210-70(3) states that, in dwelling units, a light is required in attics, under floors, etc. and must be located near the equipment requiring servicing. What is the definition of **requiring servicing**? The term is defined as a piece of equipment that will not deliver or perform its intended use without maintenance, such as replacing a filter(s), lubrication of bearings, or other actions enabling the equipment to function as designed. It is not required to have a light for equipment that is designed to be essentially maintenance free such as an attic fan. If the manufacturer's installation instructions state that the product requires no maintenance to deliver the intended service life of the product, a light will not be required. A light is required as per NEC 210-70(3) when the space is used for storage of any kind.

● What licensing is required for wiring care occupancies?

All occupancies listed in WAC 296-46-130 require general electrical (01) licensing status for contractors and installers with **some exceptions**: Residential (02) electrical status is permitted to wire facilities that operate under the guidelines of DSHS and the Department of Health and are located in family dwelling units. Other care occupancies that are healthcare treatment facilities or institutional in nature located in other than family dwelling units are not allowed to be wired by residential (02) contractors or installers. An article on boarding homes and assisted living facilities may be referenced in the January 1998 Currents Newsletter. The article states that boarding homes and assisted living facilities are classified as healthcare occupancies and are not dwelling units. The inspection fees for boarding homes and assisted living facilities are based on the commercial/industrial fee tables {WAC 296-46-910} and electrical plan review is required.

● When is existing wiring required to comply with current codes?

Remodeled and repaired structures often involve changing only a portion of the wiring. All wiring left untouched and in good condition will be considered acceptable when installed in accordance with the code in force at the time of its initial installation provided the following is considered:

- 1) Structures damaged by fire may require closer examination to determine suitability of the existing wiring. Some tests can be performed and may be required to judge the fitness of the wiring.
 - a) Over-heated insulation will be brittle and will flake off when slightly bent.
 - b) A megger test will indicate a lower than acceptable megohm level.
 - c) Close examination may reveal physical damage by falling debris.
- 2) Where insulation is to be installed around knob and tube wiring, S-Type fuses must be installed to keep the wires' amperage in the 60 deg. C column of table NEC 310-16 and NEC 240-3(d).
- 3) Load centers will be inspected for overheating, bonding, and proper fusing.
- 4) The grounding electrode system must be intact.

As always, inspectors and electricians must use their training and judgment when determining whether wiring must be updated.

● Inspection of Electrical Assemblies

Approval of electrical assemblies such as field-assembled components or manufactured assemblies within an enclosure has been an increasing debate. With the enhancement of technology and advancement of manufacturing the electrical industry has seen a flood of new and innovative products. Products range from highly complex to very simple. The need for assessment of these products has placed an elevated demand on inspection agencies and

testing laboratories. Electrical inspectors usually require electrical assemblies to be listed or evaluated by a testing laboratory. What is the requirement?

RCW 19.28.010 states, "All materials, devices, appliances, and equipment used in such installations shall be of a type that conforms to applicable standards or be indicated acceptable by the established standards of any electrical product testing laboratory which is accredited by the department." Applicable standards such as NFPA 70 (The National Electrical Code), NFPA 79, ANSI/UL Standards, NESC are examples of standards acceptable to the department. When inspecting an electrical installation or product the inspector may approve it or disapprove it based on his training, knowledge, and experience. The authority having jurisdiction has the ultimate decision making authority for approval of electrical installations. Where the National Electrical Code requires listed materials or equipment, listing is required.

● The WAC Rule Process Moves Ahead

As you may know the process is under way to revise the WAC rules (WAC 296-46)

And WAC 296-401A). The department is working continuously with our stakeholder partners to develop rules for electrical installation and licensing.

WAC 296-46-495, WAC 296-46-725, WAC 296-46-770, and others, are new or modified subsections describing the telecommunications inspection threshold, annual electrical maintenance permits, lines of demarcation, definitions of telecommunication installations, scope of work for installers and contractors. Other sections of the WAC rules are modified or created to more clarity or introduce needed rules. Below are examples of changes.

- WAC 296-46-910 has been changed to include telecommunication permit fees, and restructure HVAC/refrigeration permit fees.
- WAC 296-46-920 has been modified to include civil violations for telecommunication contractors.
- WAC 296-401A-140 has been modified to more clearly define the scope of work permitted by HVAC/refrigeration installers.
- WAC 296-46-930 has been modified to more clearly define the scope of work that HVAC/refrigeration contractors may perform.
- WAC 296-46-092 has been added for definitions of words used in the RCW and WAC.

Other sections of the WAC rules are under restructuring and modification efforts to better serve users. As always, your input is welcome if you have suggestions or comments on any part of the WAC rules that you think needs clarification or modification. This process is on a fast track. Your comments need to be submitted as soon as possible. This is your opportunity to give input.

● Isolated Metallic Elbows

The National Electrical Code (NEC 250-86) requires that metal enclosures and raceways be grounded. Metal elbows installed in nonmetallic conduit systems are not required to be grounded provided they are buried to a minimum depth of 18 inches to the top of the elbow. The purpose of this requirement is to minimize the possibility of human contact with energized parts.

● Who Can Install Conduit Systems?

There has been considerable confusion on required licensing and certification for installing conduit systems. The breakdown is as follows:

- Journeyman Certification (01): May install conduit in all occupancies as needed
- Residential Specialty (02): Limited to Nonmetallic sheathed cable (Romex) except for services, feeders, and loads related to the residence where raceway is required or desired such as nonmetallic underground installations, hot tubs and swimming pools.
- Pump and Irrigation (03), Sign and Outline Lighting (04), Domestic Well (03A), Domestic Appliance (05), Nonresidential Maintenance Specialties (07): Raceways as needed within the scope of the specialty
- HVAC/refrigeration Specialty (06A): Short sections of raceway for protection of cables only
- Limited Energy Specialty (06): Raceways as needed within the scope of the specialty. (**Note:** This specialty is normally restricted from installing conduit systems on prevailing wage jobs by labor contract).